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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/018,662	12/21/2001	Carlos Algora	70200-0005	1974

7590 03/25/2004
Clark & Brody
1750 K Street N W Suite 600
Washington, DC 20006

EXAMINER

DIAMOND, ALAN D

ART UNIT PAPER NUMBER

1753

DATE MAILED: 03/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	Application No. 10/018,662	Applicant(s) ALGORA, CARLOS	
	Examiner Alan Diamond	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-23,25-29 and 34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-23,25-29 and 34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 25, 2004 has been entered.

Comments

2. The 35 USC 102/103 rejection over Dillard has been overcome by Applicant's amendment of claim 18 so as to require a means for providing a luminous power density of greater than 1 W/cm^2 . Dillard does not teach or suggest the use of any device to concentrate light so as to achieve the instant power density. Dillard wants a minimal mass for its satellite (col. 4, line 9), and thus, there is no motivation to include, for example, a concentrating lens or mirror.

Claim Objections

3. Claims 18 and 27 are objected to because of the following informalities: In claim 18, at line 4, the term "a size is in" should be changed to "a size in". In claim 27, at line 1, the term "High" should be changed to "A high" so as to be consistent with the other claims in the instant application. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 34 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 34, at line 5-6, the term "the maximum efficiency criterion" lacks positive antecedent support in claim 18. It is suggested that the word "the" be deleted from said term.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(f) he did not himself invent the subject matter sought to be patented.

7. Claims 18-23, 25-29, and 34 are rejected under 35 U.S.C. 102(f) because the applicant did not invent the claimed subject matter. Algora et al, "A GaAs Solar Cell with an Efficiency of 26.2% at 1000 Suns and 25.0% at 2000 Suns," IEEE Transaction on Electron Devices, Vol. 48, No. 5, pages 840-844, May 2001, discloses the claimed invention (see the entire document, especially page 841). Algora et al has a different inventive entity than the instant application and is proof that applicant did not invent the claimed subject matter.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 18-23, 25-29, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fraas et al, U.S. Patent 5,123,968, in view of Tantraporn, U.S. Patent 4,336,009.

Fraas et al teaches GaAs solar cells having a size of 3 mm x 5 mm, i.e., 15 mm², wherein photolithography is used to define the frontal grid of the cells (see col. 5, lines 22-30; and col. 5, lines 55-61). The solar cells are used with respective concentrating lenses (12) at a light concentration near 100 suns equivalent, i.e., at power densities that are certainly greater than 1 W/cm² (see Figures 1 and 2; col. 3, lines 47-49; and col. 8, lines 45-46). Figure 9 of Fraas et al shows a light-concentrating cover glass (74) that is applied to the solar cell by adhesive (82) (see also col. 8, lines 13-34). Fraas et al teaches the limitations of the instant claims other than the difference which is discussed below.

Fraas et al does not specifically teach the product-by-process steps of defining numerous photovoltaic converters on a same semiconductor wafer, and separation of the converters on the same semiconductor wafer is carried out by sawing, or by cutting with a point or cleaving or by other similar technique. However, in order to obtain the GaAs wafer used by Fraas et al to prepare its GaAs solar cell, a skilled artisan would cut a GaAs ribbon or boule into appropriate dimensions, as is conventional in the art and shown by Tantraporn (see col. 1, lines 13-15; and col. 1, line 66 through col. 2, line 2). It is the Examiner's position that Fraas et al's GaAs solar cell prepared from a cut

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GaAs wafer is essentially the same as the photovoltaic converter here claimed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have obtained Fraas et al's GaAs wafer by cutting a GaAs ribbon or boule to the appropriate dimensions because such is convention in the art for obtaining a GaAs wafer.

10. Claims 18-23, 25-29, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over MacMillan et al, "28% Efficient GaAs concentrator Solar Cells," 20th IEEE Photovoltaic Specialists Conference, pages 462-468, 26-30 September 1988, in view of Tantraporn, U.S. Patent 4,336,009.

MacMillan et al teaches a GaAs solar cell having a size of 6x6 mm², i.e., 36 mm², wherein the solar cell is exposed to 1000 suns (see page 462 and Figure 1). 1000 suns is a luminous power density greater than 1 W/cm². The solar cell is prepared using conventional photolithography (see the page 464, left col., lines 10-22). MacMillan et al teaches the limitations of the instant claims other than the difference which is discussed below.

MacMillan et al does not specifically teach the product-by-process steps of defining numerous photovoltaic converters on a same semiconductor wafer, and separation of the converters on the same semiconductor wafer is carried out by sawing, or by cutting with a point or cleaving or by other similar technique. However, in order to obtain the GaAs wafer used by MacMillan et al to prepare its GaAs solar cell, a skilled artisan would cut a GaAs ribbon or boule into appropriate dimensions, as is conventional in the art and shown by Tantraporn (see col. 1, lines 13-15; and col. 1, line

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66 through col. 2, line 2). It is the Examiner's position that MacMillan et al's GaAs solar cell prepared from a cut GaAs wafer is essentially the same as the photovoltaic converter here claimed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have obtained MacMillan et al's GaAs wafer by cutting a GaAs ribbon or boule to the appropriate dimensions because such is convention in the art for obtaining a GaAs wafer.

11. Claims 18-23, 25-29, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ortiz et al, "Experimental Improvement of concentrator LPE GaAs Solar Cells for Operation at 100 Suns with an Efficiency of 26.2%," 28th IEEE Photovoltaic Specialists Conference, pages 1122-1125, 15-22 September 2000, in view of Tantraporn, U.S. Patent 4,336,009. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Ortiz et al teaches GaAs solar cells having an area of 1 mm^2 and which are exposed to 1000 suns, i.e., a luminous power density greater than 1 W/cm^2 (see the entire document, and in particular the third paragraph on page 1122; and the results section at page 1124). As seen in Figure 1, the solar cell is on a GaAs wafer substrate. Ortiz et al teaches the limitations of the instant claims other than the difference which is discussed below.

Ortiz et al does not specifically teach the product-by-process steps of defining numerous photovoltaic converters on a same semiconductor wafer, and separation of the converters on the same semiconductor wafer is carried out by sawing, or by cutting

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with a point or cleaving or by other similar technique. However, in order to obtain the GaAs wafer used by Ortiz et al to prepare its GaAs solar cell, a skilled artisan would cut a GaAs ribbon or boule into appropriate dimensions, as is conventional in the art and shown by Tantraporn (see col. 1, lines 13-15; and col. 1, line 66 through col. 2, line 2). It is the Examiner's position that Ortiz et al's GaAs solar cell prepared from a cut GaAs wafer is essentially the same as the photovoltaic converter here claimed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have obtained Ortiz et al's GaAs wafer by cutting a GaAs ribbon or boule to the appropriate dimensions because such is convention in the art for obtaining a GaAs wafer.

Furthermore, it is the Examiner's position that there is essentially no difference between the solar cell structure in Ortiz et al's Figure 1, and the solar cell obtained using the product-by-process photolithography step in instant claim 18.

12. Claims 18-23, 25-29, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Algora et al, "Design and Optimization of Very High Power Density Monochromatic GaAs Photovoltaic Cells," IEEE Transactions on Electron Devices, Vol. 45, No. 9, pages 2047-2054, September 1998, in view of Tantraporn, U.S. Patent 4,336,009.

Algora et al teaches GaAs solar cells having an area of 1.6 mm^2 and exposed to irradiance of 100 W/cm^2 (see abstract; and page 2053). Photolithography can be used to prepare the cells (see page 2053). Algora et al teaches the limitations of the instant claims other than the difference which is discussed below.

Algora et al does not specifically teach the product-by-process steps of defining numerous photovoltaic converters on a same semiconductor wafer, and separation of the converters on the same semiconductor wafer is carried out by sawing, or by cutting with a point or cleaving or by other similar technique. However, in order to obtain the GaAs wafer used by Algora et al to prepare its GaAs solar cell, a skilled artisan would cut a GaAs ribbon or boule into appropriate dimensions, as is conventional in the art and shown by Tantraporn (see col. 1, lines 13-15; and col. 1, line 66 through col. 2, line 2). It is the Examiner's position that Algora et al's GaAs solar cell prepared from a cut GaAs wafer is essentially the same as the photovoltaic converter here claimed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have obtained Algora et al's GaAs wafer by cutting a GaAs ribbon or boule to the appropriate dimensions because such is convention in the art for obtaining a GaAs wafer.

Response to Arguments

13. Applicant's arguments filed February 25, 2004 have been fully considered but they are not persuasive. With respect to Fraas et al in view of Tantraporn, Applicant argues that there is nothing "that would have led one of ordinary skill in the art to apply the techniques of Tantraporn to provide the structure now set forth in the instant claims." However, this argument is not deemed to be persuasive because Fraas et al structure is essentially the same as the instant structure. Tantraporn shows that a GaAs ribbon or boule can be cut into appropriate dimensions to prepare a solar cell.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond
March 12, 2004

Alan Diamond
Primary Examiner
Art Unit 1753

A handwritten signature in black ink, appearing to read 'Alan Diamond', written in a cursive style.